The Wafer Tumbler Lock

The wafer tumbler lock was developed as a low-cost lock that offered a reasonable degree of security to the owner. These locks are make up over one-fourth of all the locks in the world. The outside of the lock resembles the pin tumbler lock (yet to be discussed), but uses a much simpler mechanism. Wafer keyways usually have simple side ward indentions. The key is usually shorter than that of other locks, but equally broad. It may be cut on one or both sides. A two sided wafer lock is often called a "double wafer." The lock consists of four main parts. The plug housing, which contains the wafers and springs, the shell, the cam (locking bolt), and the retainer. The wafers are sometimes referred to as "discs" because their top and bottom are rounded to fit into the cylinder. Here is a diagram:

```
     5
  ___       7       |                           ___
     ||##############                      1-> @| _ |_
  ## ||## ## ## ## ##                         @||2||/
  6##||##4##3##2##1## <-keyway                 @||_||
  ## ||## ## ## ## ##                         \|___|
  ___||##############                        3
                    |
          \plug/                     detail of a wafer tumbler

   cutaway side view                       1) spring
    of a wafer lock                        2) key slot
                                           3) spring wing

  1-4) spacings #1-4
  5)   cam (operates the bolt)
  6)   retainer (rear plug)
  7)   the shell (body of the lock)
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Each lock has a series of chambers in which the wafers rest. These spacing closest to the front of the lock is numbered with one, and their numbers increase toward the back of the lock. Picture a number of the wafers placed face-to-face in the plug's spacing chambers. Each wafer is equal in overall size, but the key slots are of varying height. A metal spring exerts pressure on the spring wing of each wafer, forcing its lower part into the shell's "locking grooves" which lets the lower portion hang about midway into the keyway. Looking into the lock, you should be able to see this. These wafers act to hold the plug and shell together, preventing the lock from turning.

When the correct key is inserted, it goes through the key slots on each wafer, raising the wafers out of the locking groove. The key must have the appropriate depth of cut in each position to raise the wafer the correct amount. The depth of the key's cut (and the length of the wafer's key slot) is any one of five different depths. The shorter the top edge of the wafer's key slot, the lower the key cut depth value. For instance the number 1 slot (the slot that is the largest) would require the shallowest cut in the key. Normally lock manufacturers place a number four or five wafer near the keyhole to block the

view of the back wafers. Also note that the same type of wafer may appear several times in the same lock.

Above some brands of wafer tumbler lock you will see a small hole. When the lock has been unlocked, you can remove the entire lock plug by inserting a piece of stiff wire into this hole and depressing the retainer. Though nowhere near as secure as the pin tumbler lock, the wafer tumbler is a very popular, low cost lock. The lock is normally found on cheaper cabinets and desks, some padlocks, some automobile locks, locking handles, and trailer doors. Where more security is desired, the double wafer type is used, providing wafers on the top and bottom of the keyway.

Picking

Though harder to pick then the warded lock, the wafer lock is still easy to circumvent. This is an excellent lock to practice on because the techniques required to pick it are applicable to the pin tumbler lock as well. Like the lever lock, picking the wafer tumbler lock requires use of a tension wrench and a pick. A variety of the different picks can be used including the rake, the hook, the half-diamond, and the half-round pick. Selection depends on the size of the lock, the distance between each wafer, and personal preference.

Raking

One of the most common methods of picking the wafer tumbler lock is by raking. To rake the lock, insert the tension wrench is inserted just inside the keyway, stopping short of the first wafer, and flush with the bottom of the keyway. Apply moderate tension to the wrench. If you apply too much tension the wafers will bind and not be able to move into alignment. Once you have the tension wrench in place, insert either the rake or half-round pick into the keyway. Don't worry about feeling the tumblers, instead concentrate on applying uniform pressure to them as you move the rake in and out of the keyway in a scrubbing motion. This scrubbing motion should cause the wafers to lift into alignment as they are thrown up and down in their spacings. This method is usually quite effective on most wafer locks, and should always be tried first.

Manipulating Individual Wafers

If the lock does not respond to raking, you can try using the half-diamond pick to each wafer into alignment one-by-one. While maintaining light but consistent pressure with the tension wrench, use the pick to lift each wafer into alignment at the shear line, starting from the backmost tumbler. Once it reaches the proper alignment, you should feel or hear a slight "click" and the plug will turn ever so slightly, relieving a bit of pressure on the wrench. Continue one-by-one, working outward, until each tumbler has been aligned and the lock opens.

Vibration Picking

Often you can use a technique called vibration picking to open a wafer tumbler lock. This uses a tool known as a "snapper" pick or a "lockpick gun". [These are described in the Lockpicking Tools section of this

article] To use the snapper pick maintain a light tension with the wrench and insert the tip of the pick into the keyway, just touching the bottom of the tumblers. Then use the thumb, which rests along the top edge of the pick to depress the top loop. Let the thumb slide off the compressed part of the pick, permitting it to snap back. It will then strike a light blow to the tumblers, popping them up until they are held in place at the shear line. Repeated snaps, while maintaining tension with the wrench, usually results in aligning all the tumblers, and thus opening the lock. The lockpick gun works automatically, with a trigger device that "snaps" its wire pick up in the keyway.

Picking Double Wafer Locks

Double Wafer locks are picked the same way as single wafer locks, but there two sides to the story. Not only must you align all the top wafers, but the bottom ones as well. You can purchase special designed tension wrenches with will let you then use a ball pick to pick both sets of wafers. Alternatively you can use a standard tension wrench in the center of the keyway, using a half diamond pick. Once you have picked one set, simply reverse the pick and pick the other. It may take a few tries before you are able to hold all the wafers in place.